

REMARKS

Reconsideration of this application, as presently amended, is respectfully requested. Claims 1-22 are pending in this application. Claims 1-22 stand rejected.

Initially, it is noted that original claim 22 depends from claim 1. However, original claim 22 should properly depend from claim 21. Therefore, claim 22 has been amended to depend from claim 21.

Request to Withdraw Finality of Office Action

As will be discussed below, withdrawal of the finality of the present Office Action requested because independent claim 21 has not been amended during the prosecution, and has now been rejected over a new ground of rejection.

More specifically, regarding finality of an Office Action, the Manual of Patent Examining Procedure §706.07(a), states:

Under present practice, second or any subsequent actions on the merits shall be final, **except where the Examiner introduces a new ground of rejection that is neither necessitated by Applicant's amendment of the claims** nor based on information submitted in an Information Disclosure Statement filed during the period set forth in 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p).

Furthermore, a second or any subsequent action on the merits in any application or patent undergoing reexamination proceedings will **not be made final if it includes a rejection, on newly cited art**, other than information submitted an Information Disclosure Statement filed under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p), **of any claim not amended by Applicant or patent owner in spite of the fact that**

other claims may have been amended to require newly cited art.
[Emphasis added]

Independent claim 21 has not been amended during the prosecution of this application. Claim 21 was rejected in the previous Office Action under §103 over **Chakraborty et al.** in view of **Gonsalves**. Claim 21 is now rejected under §103 over **Chakraborty et al.** in view of **Toklu et al.** and further in view of **Gonsalves**.

Therefore, because the rejection of claim 21 is a rejection on newly cited art of a claim that was not previously amended, the rejection of claim 21 constitutes a new ground of rejection that was not necessitated by Applicants' amendment of the claims.

Accordingly, under the requirements of §MPEP 706.07(a), the finality of the current Office Action is improper and should be withdrawn. Withdrawal of the finality of the Office Action is respectfully requested.

Claim Rejections – 35 U.S.C. §103

Claims 1-6, 9-14 and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over **Chakraborty et al.** (USP 7,110,454, previously cited) in view of **Toklu et al.** (USP 6,549,643). Claims 7-8 are rejected under 35 U.S.C. §103(a) as being unpatentable over **Chakraborty et al.** in view of **Toklu et al.** and further in view of **Blanchard** (USP 6,347,114, previously cited). Claims 15 and 17-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over **Chakraborty et al.** in view of **Toklu et al.** and further in view of **Park et al.** (USP 6,597,738, previously cited). Claims 21-22 are rejected under 35 U.S.C. §103(a) as being unpatentable over

Chakraborty et al. in view of **Toklu et al.** and further in view of **Gonsalves** (USP 6,392,710, previously cited).

Initially, it is noted that in the current rejection of independent claims 1, 4, 9, 13 and 14 (and dependent claims 2-3, 5-6 and 16) under §103, the Office Action substantially repeats the rejections from the previous Office Action, except the Examiner now applies the newly cited **Toklu et al.** reference to teach the claimed “shot segmentation device to segment the video into respective shots.”

More specifically, the Office Action asserts

Chakraborty does not explicitly teach a shot segmentation device to segment the video into respective shots. However, Toklu teaches a shot segmentation device to segment the video into respective shots (video segmentation module 12, column 5, lines 38-57, and Fig. 1, element 12). See Office Action, page 8, lines 6-9.

Toklu et al. discloses a video segmentation module that partitions a video file (either stored or input as a real-time video stream) into a plurality of video segments. The video segmentation method used by **Toklu et al.** is the cut detection method that partitions video data into a set of shots comprising visually abrupt cuts or camera breaks. See col. 5, lines 37-60.

The segmenting of video data in **Toklu et al.** is performed so that a key frame (i.e., a frame to represent the content of a given shot) can be selected for each shot based on key frame selection techniques (see col. 1, lines 42-45; and col. 5, lines 61-65). Key frame selection techniques of **Toklu et al.** include analyzing camera motion between consecutive frames in a

shot, computing pixel based absolute frame differences between frames in a shot, and computing a color histogram of each frame (see, e.g., col. 5, lines 65 – col. 6, line 7).

The other references applied against the claims were discussed in previous responses, and a detailed discussion will not be reiterated here. The independent claims will be addressed separately below.

Claim 1

Claim 1 has been amended to clarify the difference between a shot and a scene. In particular, the amendments to claim 1 clarify that the scene is a larger unit than a shot, and the classified scene is smaller in number than a total number of shots.

First, it is submitted that the **Toklu et al.** reference is no more relevant than the **Chakraborty et al.** reference. More specifically, the Examiner relies on **Toklu et al** to teach segmenting a video into respective shots; however, **Chakraborty et al.** also teaches segmenting a video into units of shots (see col. 5, lines 1-2). Further, if the shot segmentation device of **Toklu et al.** is combined with the system of **Chakraborty et al.**, the result would be a system that segments video into shots and then detects a key frame for each segmented shot.

However, it is respectfully submitted that neither **Chakraborty et al.** nor **Toklu et al.** disclose or suggest the processing performed on the respective [segmented] shots (i.e., processing performed *after* the shots are segmented) in order to classify a scene.

The Examiner provides an extensive *Response to Arguments* (see pages 2-6, Items 1-15 of the Office Action). However, it is respectfully submitted that the *Response to Arguments*

does not address the main argument previously presented that **Chakraborty et al.** does not disclose or suggest any of the processing that is performed on the segmented shots (i.e., processing that is necessarily performed after the video is segmented into shots).

That is, in accordance with what was previously argued, **Chakraborty et al.** does not disclose or suggest “a shot segmentation device [that segments] the video *into respective shots*” and, after the video has been segmented into shots, “a calculator [calculates] shot density DS of the video from *said respective shots*” and “a calculator [calculates] motion intensity *of the respective shots*”; and “a dynamic/static scene classifier [classifies] *the respective shots* into a dynamic scene with much motions or a static scene with little motions based on the shot density and the motion intensity [*of the respective shots*].” [Emphasis added].

For example, in the *Response to Arguments*, the Examiner asserts:

In response to applicant's argument that the references fail to show certain features of applicant's invention, *it is noted that the features upon which applicant relies (preprocessing the detection of shot boundaries to classify the video in into units of shots before obtaining shot density and a motion intensity) are not recited in the rejected claim(s).* [Emphasis added.] See Item 3 of Office Action.

The above assertions set forth in Item 3 of the Office Action have no basis and are without merit. First, the claims clearly recite the features (preprocessing the detection of shot boundaries to classify the video into units of shots before obtaining shot density and a motion intensity) upon which applicants rely. That is, the language of claim 1 clearly defines the invention such that the “calculator for calculating shot density,” the “calculator for calculating motion intensity” and the “dynamic/static scene classifier” process (i.e., perform the recited

operations on) *the respective shots* that have been (previously) segmented (i.e., preprocessed) by the shot segmentation device.

Moreover, the Examiner continues to assert that the various interframe difference metrics of **Chakraborty et al.** correspond to the various elements recited in claim 1.

More specifically, in Item 5 of the Office Action, the Examiner asserts:

Chakraborty discloses examining frame-to-frame intensity changes as the pixel level (column 1 line 53-54); pixel activity would indicative of motion. **Chakraborty** teaches an integrated process for segmenting video shots by successfully identifying scene changes, both abrupt and gradual. A combination of a plurality of difference metrics are processed in an integrated fashion to identify and verify both gradual and abrupt scene changes in the video (column 4 line 66 to column 5 line 5). Further, **Chakraborty** discloses a predefined shot duration (column 13 line 15 to 35); which is equivalent to the shot density. Since **Chakraborty** discloses to examine the frames at a pixel level, and segmenting the video into both gradual and abrupt scenes, and the shot duration is used with detecting the abrupt scene (column 13 line 13-35), it is clear to the examiner that **Chakraborty** segments the video into abrupt or gradual scene based on motion, which reads upon the claimed limitation.

However, the Examiner's response set forth in Item 5 of the Office Action ignores the fact that, as was discussed in the previous response, (1) **Chakraborty et al.** disclose that a "scene" and a "shot" are defined as the same thing (see, e.g., col. 5, lines 44, 52 and 62) and (2) detecting a "scene change" is the same as a detecting a "cut" point (see col. 13, lines 15-35).

Thus, it is clear that determining "scene changes" in **Chakraborty et al.** is the same as identifying cut points so that shots can be determined (or segmented). Determining a "scene change" (i.e., cut point) in **Chakraborty et al.** is not the same as the claimed classifying of the respective shots into a dynamic scene or static scene. In particular, identifying a cut point (i.e.,

scene change) in **Chakraborty et al.** is a precursor to segmenting a shot. In other words, the shot has not yet segmented at the point the cut point is determined. Therefore, identifying a cut point cannot classify a shot, as claimed.

Further, contrary to the Examiner's assertions, it is clear that the use of the various metrics in **Chakraborty et al.** to identify "scene changes" can not be the same as the claimed "metrics" used to classify a scene. More particularly, the metrics in **Chakraborty et al.** are used to identify a cut point so that a *shot* can be *subsequently* segmented. In other words, the metrics in **Chakraborty et al.** are not used to process a shot that has been segmented from video. In contrast, the claimed "calculator for calculating motion intensity," "calculator for calculating shot density" and "dynamic/static scene classifier" are used to analyze (i.e., calculate shot density, calculate motion intensity, classify into a dynamic or static scene) the segmented shots.

In view of the foregoing, reconsideration and withdrawal of the rejection of claim 1 are respectfully requested.

Claim 4

With respect to claim 4, it is submitted that none of the cited references disclose or suggest the claimed "slow scene detector for classifying the target *shot* into a slow scene of the similar *shot* based on motion intensity of the target *shot* and the similar *shot*."

The Examiner apparently considers the gradual scene change disclosed by **Chakraborty et al.** (see col. 7, lines 49-50) to correspond to the claimed "slow scene detector". See Office

Action, page 9, last four lines). However, the “gradual scene change” disclosed by **Chakraborty et al.** is not a shot. The gradual scene change is a portion between detected scenes. Therefore, **Chakraborty** is not classifying a target shot.

Further, **Chakraborty et al.** does not disclose or suggest that the “slow scene” is detected based on *motion intensity* of the target shot and the similar shot.

Claim 9

With respect to claim 9, in the previous response, it was agued that **Chakraborty et al.** does not teach performing operations on segmented shots, specifically, “a detector for detecting a histogram relating to *motion directions* of the respective [segmented] shots.” Furthermore, it was argued that the claimed “histogram relating to motion directions of the respective shots” is different from the histogram difference metric of **Chakraborty et al.**, which is related to pixel intensity distribution of an image. These arguments are hereby reiterated.

In Item 3, last sentence, the Examiner concludes “Chakraborty discloses examining pixels at a frame-to-frame intensity changes at the pixel level, which would [be] indicative of motion (column 1, lines 53-54), Chakraborty discloses a predefined shot duration (column 13, lines 15-35), which is equivalent to shot density.”

It is noted that **Chakraborty et al.** teaches that interframe difference methods of detecting scene changes (cuts) are particularly sensitive to object motion and camera motion (see col. 2, lines 57-60). However, the statement that interframe difference methods are *sensitive* to motion, does not teach that these interframe difference methods detect motion *direction*.

Chakraborty et al. is silent with respect to detecting motion direction using the interframe difference metrics.

Moreover, arguments similar to those presented above with respect to claim 1 are also appropriate. More particularly, the various metrics disclosed in **Chakraborty et al.** are used to identify a cut point so that a shot can subsequently be segmented. In other words, the metrics in **Chakraborty et al.** do not analyze, or perform operations on, a segmented shot. That is, the various metrics of **Chakraborty et al.** do not disclose or suggest “a detector for detecting a histogram relating to motion directions *of the respective shots*” because the shots are not segmented when the various metrics are applied to the frames of the video.

Accordingly, reconsideration and withdrawal of the rejection of claim 9 are respectfully requested.

Claim 13

Regarding claim 13, it was previous argued that **Chakraborty et al.** do not disclose or suggest “a detector for detecting a shot density DS of the video” and “a commercial scene detector for detecting a commercial scene by comparing a shot density detected during a predetermined interval with a predetermined reference shot density.”

The Examiner had not previously responded to these arguments. The Examiner now responds to these arguments in Items 8 and 9 of the Office Action. Specifically, the Examiner asserts:

Regarding applicants['] argument that **Chakraborty** does not disclose the "detector for detecting a shot density DS of the video" and "a commercial scene detector for detecting a commercial scene by comparing a shot density detected during a predetermined interval with a predetermined reference shot density".

The examiner respectfully disagrees. **Chakraborty** discloses video are playing an increasingly import role in education and commerce, Column 1 line 15-18. Further, when the approximate maximum duration is known, since the frames/sec is always known, the maximum frame duration for the scene change is readily ascertainable. If any of the windows have a duration that exceeds this threshold, it may be assumed that the window in question is not likely to be a gradual scene change. In such as case, further examination becomes necessary. The possibilities are that either the window represents just motion or a combination of scene change and motion. In the preferred embodiment, if any window has a duration that exceeds the predefined threshold, it is assumed that the window represents motion, and consequently all points in such window are turned "off" (step 224). All the remaining windows are then identified as candidates for gradual scene change, column 14 lines 20-35. **Chakraborty** teaches a predefined shot duration (column 13 line 15 to 35); which is equivalent to the shot density. Therefore, since **Chakraborty** discloses videos in education and commerce, and based on the predefined window threshold, the scene is either gradual or abrupt, it is clear to the examiner that **Chakraborty** is fully capable of detecting a commercial scene based on the shot density, which reads upon the claimed limitation.

As best understood, it appears that the Examiner believes that "shot duration" is the same as "shot density". The Examiner cites col. 13, lines 15-35 of **Chakraborty et al.**, which relates to determining whether a distance between any two abrupt scene changes is less than a predetermined minimum shot duration (see Fig. 2B, step 215 and col. 13, lines 24-28).

First, it is submitted that "shot duration" is not the same as "shot density." However, based on the assertion that "shot duration" is not the same as "shot density," the Examiner relies

on a portion of **Chakraborty et al.** that teaches verifying whether the duration of each individual scene change (cut) is too large (see col. 14, lines 10-35) to teach “comparing a shot density detected during a predetermined interval with a predetermined reference shot density.”

More specifically, col. 14, lines 10-35 of **Chakraborty et al.** teaches comparing the duration of a detected (candidate) scene change with a predetermined threshold duration (e.g., one or two seconds). If the duration of the detected scene change is greater than the predetermined threshold duration, the duration of the individual scene change is determined to be too large, and it is assumed that the (candidate) scene change is motion, and is not a scene change (see col. 14, lines 29-33).

However, it is submitted that, contrary to the Examiner’s assertions, “shot duration” (described in col. 13) and “scene change duration” (described in col. 14) are not the same as “shot density.”

Accordingly, reconsideration and withdrawal of the rejection of claim 13 are respectfully requested.

Claim 14

In the previous responses, it was argued that **Chakraborty et al.** does not disclose or suggest detecting a commercial scene based on a number of shot boundaries detected. The Examiner had not previously responded to these arguments. The Examiner now responds to these arguments in Items 10 and 11 of the Office Action, as follows:

Regarding applicants['] argument that the reference does not disclose or suggest detecting a commercial scene based on a number of shot boundaries detected.

The examiner respectfully disagrees **Chakraborty** discloses video in education and commerce, column 1 line 16-18. As defined by Merriam-Webster Dictionary, a commercial has to do with commerce. Further, the intensity range of a given frame is divided into a number of predefined bins, with each bin corresponding to an intensity range. Next, the number of pixel in each bin counted to generate the corresponding distribution comprising the histogram, column 8, lines 51-55.

Applicants agree with the Examiner's general assertion that a commercial has to do with commerce. Otherwise, the Examiner's position is not understood. Specifically, it is not understood how the *intensity range of a given frame* relates to "a commercial scene detector for detecting a commercial scene *by comparing a number of shot boundaries detected during a predetermined interval with a predetermined reference number.*" The intensity range of a given frame is unrelated to shot boundaries and comparing a number of shot boundaries detected during a predetermined interval with a predetermined reference number.

In any event, the Examiner has not pointed out where **Chakraborty et al.** explicitly, implicitly or inherently discloses "a commercial scene detector for detecting a commercial scene *by comparing a number of shot boundaries detected during a predetermined interval with a predetermined reference number.*"

Therefore, the rejection of claim 14 is improper and should be withdrawn.

Claim 21

In the previous response, it was argued that neither **Chakraborty et al.** nor **Gonsalves** disclose or suggest “extracting and combining means for extracting and combining a plurality of highlight scenes” and “inserting means for inserting a video transition effect into a combined portion of the respective highlight scenes, wherein the inserting means makes a type of the video transition effect to be inserted different according to whether the highlight scenes to be combined are the dynamic scene or the static scene.”

The Examiner responds to these arguments in Items 12-15 of the Office Action as follows:

Regarding applicants['] argument that the combination of **Chakraborty** and **Gonsalves** does not disclose “extracting and combining means for extracting and combining a plurality of highlight scenes”.

The examiner respectfully disagrees. **Chakraborty** teaches after the different scenes (shots) are determined, the scene change validation module 20, as an additional validation process, extracts keyframes for each of the shots and compares neighboring keyframes. If the keyframes are not sufficiently different, the corresponding shots are merged, column 7 line 52-56. **Chakraborty** discloses to merge the corresponding shots of the keyframes that are not sufficiently different, it is clear to the examiner that the corresponding shots merged from the keyframes that are not sufficiently different, reads upon the claimed limitation; as understood by the examiner a highlight scene can either be abrupt or gradual.

Regarding applicants argument that the combination of **Chakraborty** and **Gonsalves** does not disclose an “inserting means for inserting a video transition effect into a combined portion of the respective highlight scenes, wherein, the inserting means makes a type of the video transition effect to be different according to whether the highlight scenes to be combined are the dynamic or the static scene.”

The examiner respectfully disagrees. **Chakraborty** discloses a transition between two shots is made in a gradual manner using special editing machines to achieve a visually pleasing effect. These types of gradual changes are also called "optical cuts". There are several types of optical cuts, such as "fade in", "fade out", "dissolve", "wipe", "flips", "superimpose", "blow-ups", "move-ins", etc. column 1 line 55-61. **Gonsalves** teaches a non-linear video editing system, with the capacity to display and modify video frame on a field-by field basis, has the capacity to implement special effects on a field-by field basis, thus increasing the accuracy of the effect, column 3 line 10-13. Since **Gonsalves** discloses to implement special effects on a field by field basis, it is clear to the examiner, that **Gonsalves** would be fully capable of inserting different effects based on the type of scenes, which reads upon the claimed limitation.

As best understood, the Examiner interprets the merging of two neighboring scenes (shots) if keyframes extracted from the shots are not sufficiently different (see **Chakraborty et al.** col. 7, lines 52-60) to correspond to the claimed "extracting and combining means for extracting and combining a plurality of highlight scenes."

However, it is submitted that the rejection is improper because **Gonsalves** does not teach inserting a different type of video transition effect *according to whether the highlight scenes to be combined are a dynamic scene or a static scene*. As noted above, the Examiner asserts "Since **Gonsalves** discloses to implement special effects on a field by field basis, it is clear to the examiner, that **Gonsalves** *would be fully capable* of inserting different effects based on the type of scenes, which reads upon the claimed limitation."

However, the standard under §103 is not that a reference "would be capable" of performing a certain claimed feature. The reference must disclose or suggest the claimed feature. The Examiner does not point out where **Gonsalves** teaches inserting a different type of video

transition effect between combined highlight scenes *according to whether the highlight scenes to be combined are a dynamic scene or a static scene.*

Therefore, the rejection of claim 21 is improper and should be withdrawn.

The remarks above address the independent claims. However, the dependent claims also patentably distinguish over the cited references by virtue of their dependency on the independent claims.

CONCLUSION

In view of the foregoing, it is submitted that all pending claims are in condition for allowance. A prompt and favorable reconsideration of the rejection and an indication of allowability of all pending claims are earnestly solicited.

If the Examiner believes that there are issues remaining to be resolved in this application, the Examiner is invited to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite and complete prosecution of this case.

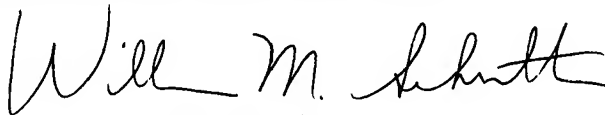
Application No.: 10/670,245
Art Unit: 2621

Amendment under 37 C.F.R. §1.116
Attorney Docket No.: 031198

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

A handwritten signature in black ink, appearing to read "Will M. Schertler". The signature is fluid and cursive, with the first name "Will" being particularly prominent.

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